

1122-35-280

Jacob Bedrossian* (jacob@cscamm.umd.edu), 1400 Irving St NW, Apt 947, Washington, DC 20010. *Nonlinear Echoes and Landau damping with insufficient regularity.*

In this talk, we will discuss recent advances towards understanding the regularity hypotheses in the theorem of Mouhot and Villani on Landau damping near equilibrium for the Vlasov-Poisson equations on $\mathbb{T}^d \times \mathbb{R}^d$. Specifically, we will discuss the recent proof that it cannot, in general, be extended to Sobolev spaces on $\mathbb{T} \times \mathbb{R}$. This is demonstrated by constructing a sequence of homogeneous background distributions and arbitrarily small perturbations in H^s which deviate arbitrarily far from free transport for long times. The density experiences a sequence of nonlinear oscillations that damp at a rate which is arbitrarily slow compared to the predictions of the linearized Vlasov equations. The nonlinear instability is due to the repeated re-excitation of a resonance known as a plasma echo. Connections with the stability of shear flows in the 2D and 3D Navier-Stokes equations may also be discussed if time permits. (Received August 15, 2016)